REMARKS

Prior to this Amendment, claims 21-36 were pending. By this Amendment, claims 21-25 have been canceled. Thus, if this Amendment is entered, claims 26-36 will be pending.

Claims 31 and 36 have been amended to correct their dependencies, in view of the cancellation of claim 21.

This Amendment should be entered in view of 37 C.F.R. §1.116(b)(1) and (b)(2).

The cancellation of claims 21-25 complies with 37 C.F.R. §1.116(b)(1): "An amendment may be made canceling claims or complying with any requirement of form expressly set forth in a previous Office Action."

Claims 31 and 36 have been amended to correct their dependencies, in view of the cancellation of claim 21. This places claims 31 and 36 in better form for appeal. See 37 C.F.R. §1.116(b)(2): "An amendment presenting rejected claims in better form for consideration on appeal may be admitted."

Claim objections

The objection to the claims because claims 26-30 are allegedly substantial duplicates of claims 21-25 was maintained.

The Applicants do not agree that claims 26-30 are substantial duplicates of claims 21-25. Nevertheless, in the interests of expediting prosecution, claims 21-25 have been canceled. The Applicants reserve the right to prosecute claims 21-25 in continuing applications.

The rejections under 35 U.S.C. §103(a)

The rejection of claims 21-30 as being obvious over Stott et al., The Veterinary Record, October 10, 1987, pages 342-347 (Stott), in view of Poumarat et al., 1994, Vet. Microbiol. 40:305-321 (Poumarat), in view of Gourlay et al., 1979, Res. Vet. Sci. 27:233-237 (Gourlay), and further in view of Chima et al., 1980, Vet. Microbiol. 5:113-122 (Chima), was maintained.

The Applicants continue to traverse this rejection. The cited prior art lacks any disclosure or suggestion of "an immunologically effective amount of ... an inactivated *Mycoplasma alkalescens*," as required by all the claims.

The only publication cited that relates to *Mycoplasma alkalescens* is Gourlay. But Gourlay does not teach or suggest using *Mycoplasma alkalescens* in a vaccine and does not teach or suggest inactivated *Mycoplasma alkalescens.*

Gourlay showed that *Mycoplasma alkalescens* is able to colonize the bovine respiratory tract but did not show that *Mycoplasma alkalescens* could produce clinical disease. See page 234, right column, under the heading "Results," where Gourlay states: "Clinical signs of disease were not observed in any of the calves." See also the abstract, at page 233, left column: "Strains of *M. alkalescens* and *M. arginini* colonized the lower respiratory tract but failed to produce visible pneumonia."

There would be no reason for one of ordinary skill in the art, upon reading Gourlay, to include *Mycoplasma alkalescens* in a vaccine. Vaccines are produced to combat microorganisms that produce clinical disease, not to combat microorganisms that merely colonize an animal. In fact, it is well know in the art that there are occasions where colonization by microorganisms is beneficial to an animal.

Gourlay does not mention or suggest inactivated *Mycoplasma alkalescens.* In an attempt to remedy Gourlay's lack of a teaching or suggestion of inactivated *Mycoplasma alkalescens,* the Office Action refers to Chima, which is said to teach inactivated vaccines.

But since Gourlay did not suggest the desirability of including *Mycoplasma alkalescens* in a vaccine, the mere fact that Gourlay could be modified along the lines of Chima to give inactivated *Mycoplasma alkalescens* is not sufficient to make obvious the present claims. *See In re Fritch*, 972 F.2d 1260, 1266, 23 U.S.P.Q.2d 1780, 1783-1784 (Fed. Cir. 1992): "The mere fact that the prior art may be modified in the manner

suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification."

The Applicants also continue to traverse this rejection because the cited references teach away from the present invention. Claims 21-30 all require at least two *Mycoplasma bovis* biotypes and Poumarat teaches away from the use of more than one biotype. Poumarat divided *Mycoplasma bovis* isolates into 13 different "genomic groups." Poumarat then looked at the antigenic variability between and among these genomic groups. Although Poumarat found much antigenic variability, this variability did not correlate with membership in any particular genomic group. In other words, the same amount of antigenic variability could be found within groups as between groups. See page 318, 2nd paragraph:

> Antigenic profiles of the *M. bovis* strains obtained by immunoblotting with J008 calf serum differed markedly one from the other, the heterogeneity being equally great among strains belonging to the same genomic group and those coming from different genomic groups. There appeared to be no relation between the genomic variability of *M. bovis* and the antigenic variability ...

Because Poumarat teaches that antigenic variability is as great within *Mycoplasma bovis* groups as across *Mycoplasma bovis* groups, Poumarat teaches that there would be no gain in antigenic variability from including more than one type of *Mycoplasma bovis* in a vaccine. That is, there would be no point in having more than one type of *Mycoplasma bovis* in a vaccine. Poumarat thus discourages one of ordinary skill in the art from including more than one biotype in a vaccine.

By discouraging those of ordinary skill in the art from including more than one biotype in a vaccine, Poumarat teaches away. "A prior art reference may be considered to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 885, 45 USPQ2d 1977, 1984 (Fed. Cir. 1998).

In response to the Applicants' discussion of the cited references above, the Office Action provided the following arguments that supposedly show why the Applicants' arguments are not persuasive:

At page 5, lines 10-14, the Office Action argued that the Applicant had not addressed the combination of references but instead had addressed the references individually.

The Office Action is incorrect. The Applicants' analysis was proper and did address the combination of references. The Applicants first noted that all the claims contain the limitation of at least two types of *Mycoplasma bovis*. The Applicants then addressed the combination of references by pointing out that only Poumarat among the references cited discloses at least two types of *Mycoplasma bovis* (i.e., that none of the other cited references did so) and that Poumarat teaches away from the use of at least two types of *Mycoplasma bovis*. Thus, since the claim limitation in question is completely lacking in the prior art, and in fact is taught against, the Applicants' analysis was procedurally correct and demonstrated that the obviousness rejection was improper.

At page 5, line 16 to page 6, line 2, the Office Action argued that:

> Poumarat et al teach that variations in expression occurred not only from one strain to another but also within the same lineage of clones from a single cell (see the Abstract). Poumarat et al teach that heterogeneity is great among the same genomic group and between different genomic groups of M. bovis strains (page 318). [underscoring added]

The above argument from the Office Action actually further supports the Applicants' position. The Applicants' position is that Poumarat teaches that antigenic variability is as great within *Mycoplasma bovis* groups as across *Mycoplasma bovis* groups. Therefore, Poumarat teaches that there would be no gain in antigenic variability from including more than one type of *Mycoplasma bovis* in a vaccine. The Applicants' argument is echoed by the about quote from the Office Action: "Poumarat et al teach that heterogeneity is great among the same genomic group and between different genomic groups of M. bovis strains."

That antigenic variation occurs within even clones from a single cell would tend to further decrease any incentive to use more that one biotype in a vaccine. Why bother with more than one biotype if the required antigenic variation can be found not just within a single genomic group but even within clones of a single cell?

At page 6, lines 2-4, the Office Action argued that "Poumarat et al suggest that it [sic, is?] evident that antigenic variability must be taken into account when developing diagnostic tools as well as vaccination strategies for treating M. bovis infections (page 319)."

Even if true, this does not support an obviousness rejection of the present claims. The question for this rejection is not whether antigenic variability must be taken into account. The question is: how should antigenic variability be taken into account? Poumarat teaches that there is no need for more than a single type of *M. bovis* in order to obtain a vaccine that has the required antigenic variability. In fact, Poumarat goes as far as suggesting that even clones from a single cell might be sufficient.

At page 6, lines 12-13, the Office Action states that "The Examiner's [sic] disagrees with Applicant's [sic] assertion that 'genetic differences are irrelevant with respect to antigenicity.' "

It is not just the Applicants' assertion. It is the prior art's assertion. Poumarat explicitly states: "There appeared to be no relation between the genomic variability of *M. bovis* and the antigenic variability." See Poumarat, page 318, 2nd paragraph.

In view of the above, it is respectfully requested that this rejection be withdrawn.

A new rejection was made of claims 21-36 as being obvious over Stott in view of Poumarat, Gourlay, Chima, and further in view of Rawadi, 1998, Methods in Molecular Biology 104:179-187 (Rawadi).

Stott, Poumarat, Gourlay, and Chima were applied in this new rejection in the same manner as those references were applied in the rejection discussed above that was maintained. Accordingly, for the same reasons as discussed above, those references are not capable of supporting this new rejection.

In this regard, it should be noted that Poumarat's teaching away is especially pertinent in connection with claims 31-36. These claims all require that the at least two biotypes be genetically different, as judged by analysis of DNA or RNA. Poumarat teaches that such genetic differences are irrelevant with respect to antigenicity since Poumarat teaches that there appears to be "no relation between the genomic variability

of *M. bovis* and the antigenic variability." One of ordinary skill in the art would invariably interpret this as a teaching that nothing is to be gained from including biotypes that are genetically different in a vaccine, and thus would be led directly away from the invention of claims 31-36.

Rawadi was cited because Stott, Poumarat, Gourlay, and Chima "do not teach using DNA polymorphisms to determine different *M. bovis* biotypes." (Office Action, page 8, lines 21-22).

Rawadi contains no teaching or suggestion that more than a single type of *M. bovis* should be used in a vaccine. Rawadi is directed to methods of distinguishing mycoplasmas for diagnostic purposes. Thus, Rawadi does not cure the defects of Stott, Poumarat, Gourlay, and Chima, and thus adding Rawadi to the combination of Stott, Poumarat, Gourlay, Chima does not make obvious the present claims.

In view of the above, it is respectfully requested that this rejection be withdrawn.

The Applicants note that the claims of U.S. Patent No. 6,548,069 were allowed by the same Examiner that is rejecting the present claims although the claims of U.S. Patent No. 6,548,069 are very similar to the present claims. See below:

Present claim 26:

> A vaccine composition comprising
> (a) an immunologically effective amount of (i) at least two inactivated *Mycoplasma bovis* biotypes and (ii) an inactivated *Mycoplasma alkalescens*, wherein said immunologically effective amount is protective in a vaccinate against Bovine Respiratory Disease resulting from *Mycoplasma* infection;
> (b) an adjuvant; and
> (c) a pharmaceutically effective carrier.

Claim 1 of U.S. Patent No. 6,548,069

> A vaccine composition comprising a) an immunogenically effective amount of (i) at least two killed Mycoplasma bovis selected from the group consisting of a biotype IV isolate, a biotype V isolate, a biotype VI isolate, and (ii) a killed Mycoplasma alkalescens, wherein said immunogenically effective amount is sufficient to produce a protective response in a vaccinate against Bovine Respiratory Disease resulting from Mycoplasma infection; b) an adjuvant; and c) a pharmaceutically effective carrier.

The table below shows a limitation-by-limitation comparison of present claim 26 and claim 1 of U.S. Patent No. 6,548,069.

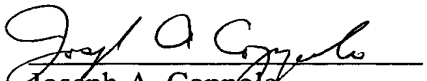
Present claim 26	**Claim 1 of U.S. Patent No. 6,548,069**
A vaccine composition comprising	A vaccine composition comprising
(a) an immunologically effective amount of	a) an immunogenically effective amount of
(i) at least two inactivated *Mycoplasma bovis* biotypes and	(i) at least two killed Mycoplasma bovis selected from the group consisting of a biotype IV isolate, a biotype V isolate, a biotype VI isolate, and
(ii) an inactivated *Mycoplasma alkalescens*, wherein said immunologically effective amount is protective in a vaccinate against Bovine Respiratory Disease resulting from *Mycoplasma* infection	(ii) a killed Mycoplasma alkalescens, wherein said immunogenically effective amount is sufficient to produce a protective response in a vaccinate against Bovine Respiratory Disease resulting from Mycoplasma infection
(b) an adjuvant; and	b) an adjuvant; and
(c) a pharmaceutically effective carrier	c) a pharmaceutically effective carrier

The time for responding to the Office Action was set for April 25, 2006. Enclosed herewith is a Petition for the Extension of Time under 37 C.F.R. § 1.136(a) for a period sufficient to permit the filing of this response. Please charge any corresponding fees for the Petition to Kenyon & Kenyon's Deposit Account No. 11-0600.

The Applicants hereby make a Conditional Petition for any relief available to correct any defect seen in connection with this filing, or any defect seen to be remaining in this application after this filing. The Commissioner is authorized to charge Kenyon & Kenyon's Deposit Account No. 11-0600 for the Petition fee and any other fees required to effect this Conditional Petition.

Respectfully submitted,

Dated: JUNE 12, 2006



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